

## **REMARKS**

### **In the Claims:**

Claims 1, 3-14, 16-20, and 28-38 remain in this application. Claims 1, 9, and 16 have been amended. Claims 2, 15, and 21-27 have been canceled. New claims 28-38 have been added.

Claim 15 appeared in the preliminary amendment of May, 2004. However, that claim had been canceled in a response to the July 31, 2002 Office Action. Applicants are not aware of any reinstatement of claim 15 in the record. Claim 15 has thus been listed as canceled in the listing of claims found above.

Claims 28-38 have been added. Claims 28 and 36 recite recesses with two widths in the ILD layer. Support for this claim can be found in Figure 4 and in the Specification at page 15, lines 11-13. Claims 29-33 and 37-38 recite relative thicknesses of the ILD, etch stop, and barrier layers. Support for these claims can be found in the Specification at page 11, line 22 through page 13, line 9. Claim 34 recites compositions and relative thicknesses of the ILD, etch stop, and barrier layers. Support for this claim can be found in the Specification at page 11, line 22 through page 13, line 9. Claim 35 recites a device with three layers on a substrate, where the second layer has an etch rate in a selected etch process that is less than the etch rate of the ILD layer in the selected etch process. Support for this claim can be found in Figure 1 and the Specification at page 10, lines 20-21, among other places.

### **Rejections Under 35 U.S.C. 103(a):**

Claims 1 and 5-8 were rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US 6,211,061) (hereinafter "Chen") in view of Fink et al. ("Standard Handbook

for Electrical Engr.” McGraw-Hill, New York (1968)) (hereinafter “Fink”) and Chao et al. (US 6,429,119) (hereinafter “Chao”). Claims 9, 10, and 16-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Chao.

None of Chen, Chao, or Fink disclose or suggest a diffusion barrier layer on a substrate, an etch stop layer on the diffusion barrier layer, and an ILD layer on the etch stop layer as recited in claims 1, 9 and 16. The Examiner has mischaracterized the hard mask layer (34) of Chen as an interlayer dielectric (ILD) layer. The Examiner has also mischaracterized the dielectric layer (30) of Chen as an etch stop layer.

A hard mask layer may be used when patterning (etching) a layer beneath the hard mask layer when an etching process has a low selectivity to the photoresist. An ILD layer provides insulation for an interconnect level (Specification page 2, lines 8-12). Further, (as pointed out in Applicants response mailed December 29, 2003) those skilled in the art will recognize that an etch stop layer is not merely defined by its composition, but rather its ability to stop an etch of another layer by virtue of its etch selectivity to the other layer (Detailed Description of the present invention page 7, lines 12-13, page 10, lines 21-22). Because a selected etch process will etch the layer above the etch stop layer at a rate greater than the etch stop layer, the etch stop layer is typically used to stop an etch process used to etch a layer above the etch stop layer from affecting the layer below the etch stop layer.

As described in Chen, “The hard mask layer (34) and the dielectric layer (30) are patterned to form a trench in the dielectric layer (30).” Thus, the dielectric layer (30) is not an etch stop layer as understood by those of skill in the art. It is simply a patterned layer with the hard mask layer (34) aiding in the patterning, as would be expected by one of skill in the art. Because dielectric layer (30) of Chen is not an etch stop layer, Chen fails to disclose or suggest a diffusion barrier layer on a substrate, an etch stop layer on the diffusion barrier

layer, and an ILD layer on the etch stop layer. Neither of the other cited references rectifies this deficiency.

Because claims 1, 9, and 16 are nonobvious as discussed above, claims 3-8, 10-14, and 17-20 are also nonobvious. If an independent claim is nonobvious, then any claim depending from the independent claim is also nonobvious. In re Fine, 5 USPQ2d 1596 (Fed. Cir. 1998). Claims 3-8 depend from claim 1, claims 10-14 depend from claim 9, and claims 17-20 depend from claim 16.


Additionally, the cited references fail to disclose or suggest the limitations recited in the new claims 28-38.

Pursuant to 37 C.F.R. 1.136(a)(3), applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 C.F.R. 1.16 and 1.17, to Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

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Michael A. Bernadicou  
Reg. No. 35,934

Customer No.: 08791  
12400 Wilshire Boulevard  
Seventh Floor  
Los Angeles, CA 90025-1026  
(408) 720-8300